

WHAT IS CLAIMED IS:

1. A method of assessing a predisposition to a physiological disorder associated with magnesium binding defect in an individual, comprising: measuring the level of peptide in a sample of body fluid of said individual, said peptide comprising one or more of amino acid sequence set forth in SEQ ID NO:1, or amino acid sequence set forth in SEQ ID NO:2, or amino acid sequence set forth in SEQ ID NO:4, and comparing said level of peptide to a standard, whereby a significantly lower level of said peptide is indicative of a predisposition of said individual to said physiological disorder.
2. The method of claim 1 wherein said predisposition to a physiological disorder associated with magnesium binding defect is a predisposition to presenting preeclampsia during pregnancy.
3. The method of claim 2 wherein the level of said peptide in said sample is measured by an immunological assay that can indicate the presence of one or more of amino acid sequence set forth in SEQ ID NO:1, or amino acid sequence set forth in SEQ ID NO:2, or amino acid sequence set forth in SEQ ID NO:4.
4. The method of claim 3 wherein said immunological assay utilizes a monoclonal antibody.
5. The method of claim 4 wherein said monoclonal antibody cross reacts with each of said peptides.
6. The method of claim 3 wherein said immunological assay is an enzyme-linked immunosorbent assay, and said sample of body fluid is blood.
7. The method of claim 1 wherein said predisposition to a physiological disorder associated

with magnesium binding defect is a predisposition to salt-sensitive essential hypertension.

8. The method of claim 7 wherein the level of said peptide is measured by an immunological assay that can indicate the presence of one or more of amino acid sequence set forth in SEQ ID NO:1, or amino acid sequence set forth in SEQ ID NO:2, or amino acid sequence set forth in SEQ ID NO:4.
9. The method of claim 8 wherein said immunological assay utilizes a monoclonal antibody.
10. The method of claim 9 wherein said monoclonal antibody cross reacts with each of said peptides.
11. The method of claim 8 wherein said immunological assay is an enzyme-linked immunosorbent assay.
12. The method of claim 7, further wherein said method distinguishes between salt-sensitive essential hypertension and salt-resistant essential hypertension disorders in an individual.
13. The method of claim 1 wherein said predisposition to a physiological disorder associated with magnesium binding defect is a predisposition to type 2 diabetes mellitus associated with the magnesium binding defect.
14. The method of claim 13 wherein the level of said peptide is measured by an immunological assay that can detect the presence of one or more of amino acid sequence set forth in SEQ ID NO:1, or amino acid sequence set forth in SEQ ID NO:2, or amino acid sequence set forth in SEQ ID NO:4.
15. The method of claim 14 wherein said immunological assay utilizes a monoclonal antibody.

16. The method of claim 15 wherein said monoclonal antibody cross reacts with each of said peptides.
17. The method of claim 14 wherein said immunological assay is an enzyme-linked immunosorbent assay.
18. The method of claim 13, further wherein said method distinguishes between lipid-induced type 2 diabetes mellitus and type 2 diabetes mellitus associated with magnesium binding defect in an individual.
19. A method for monitoring progress in treatment of a physiological disorder associated with magnesium binding defect in an individual, comprising:
  - a. measuring the level of peptide in a sample of body fluid of said individual, said peptide comprising one or more of amino acid sequence set forth in SEQ ID NO:1, or amino acid sequence set forth in SEQ ID NO:2, or amino acid sequence set forth in SEQ ID NO:4;
  - b. comparing said level of peptide to the level of said peptide after treatment, whereby a significant increase in the level of said peptide is indicative of the progress of treatment of said individual.
20. A monoclonal antibody that specifically binds to a peptide or its peptide mimetic comprising:
  - a. one or more of amino acid sequence set forth in SEQ ID NO:1;
  - b. amino acid sequence set forth in SEQ ID NO:2;
  - c. amino acid sequence set forth in SEQ ID NO:4.
21. A prognosis reagent for determining presence of magnesium binding defect, comprising

the monoclonal antibody of claim 20.

22. A method for generating a deficit of plasma membrane tightly bound magnesium ion in mammalian somatic cells, comprising:
  - a. obtaining a sample of body fluid comprising somatic cells;
  - b. collecting said somatic cells from said body fluid by centrifugation;
  - c. resuspending the somatic cells in a cell stabilizing buffer including about 1 to 1.5 mg/ml sodium deoxycholate;
  - d. removing a sample of said suspended somatic cells;
  - e. measuring the level of tightly bound magnesium ion in said sample of the somatic cells; and
  - f. repeating steps d. and e. at subsequent times until said level of tightly bound magnesium is significantly reduced and the somatic cells remain intact.
23. The method of claim 22 wherein said body fluid is human blood and said somatic cells are erythrocytes, and further, wherein an anticoagulant is added to said sample of human blood.
24. The method of claim 23, wherein said anticoagulant is sodium heparin or sodium citrate, and said cell stabilizing buffer without magnesium is Alsever's solution.
25. A method for identifying substances which promote binding of tightly bound magnesium ion to a plasma membrane of mammalian somatic cells, comprising:
  - a. suspending mammalian somatic cells having a deficit of plasma membrane tightly bound magnesium in a physiological medium, including magnesium ion;

- b. adding a substance to be tested to said suspension;
- c. measuring the level of tightly bound magnesium ion in the plasma membrane of the somatic cells of step b.,

wherein a significant increase in the level of plasma membrane tightly bound magnesium after addition of the substance to be tested is indicative of promotion of binding by said substance.

- 26. The method of claim 25, wherein said mammalian somatic cells having a deficit of plasma membrane tightly bound magnesium are generated by the method of claim 26.
- 27. A monoclonal antibody that specifically binds to a substance identified by the method of claim 25 as a substance which promotes binding of tightly bound magnesium ion.
- 28. The method of claim 26, wherein said somatic cells are erythrocytes and said physiological medium is Krebs mammalian Ringer solution, including glucose.
- 29. A method for ameliorating or correcting a magnesium binding defect in an individual, comprising administering to said individual a substance identified by the method of claim 25 as a substance which promotes binding of tightly bound magnesium ion to the plasma membrane of mammalian somatic cells.
- 30. The method of claim 29, wherein said promoter is a peptide or its peptide mimetic, wherein said peptide comprises amino acid sequence set forth in SEQ ID NO:1, or amino acid sequence set forth in SEQ ID NO:2, or amino acid sequence set forth in SEQ ID NO:4.